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| 09/869,931      | 07/09/2001  | Stanley B. Mirviss   | ACR6100US           | 1591             |

7590 07/07/2005

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EXAMINER

OH, TAYLOR V

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1625

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/869,931

Applicant(s)

MIRVISS ET AL.

Examiner

Taylor Victor Oh

Art Unit

1625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 6,17,18,22-24 and 29-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-16,19-21 and 25-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/11/01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

5.0.0

**The Status of Claims:**

Claims 1-32 are pending.

Claims 1-5, 7-16, 19-21, and 25-28 have been rejected.

Claims 6, 17-18, 22-24, and 29-32 have been withdrawn.

**DETAILED ACTION**

**Priority**

A. It is noted that this application is a 371 of PCT/US99/31246 filed on 12/30/1999

**Drawings**

B. None.

***Lack of Unity***

Applicant's election with traverse of Group I (claims 1-5, 7-16, 19-21, and 25-28) on 3/11/05 is acknowledged. Group II (claims 6, 17-18, 22-24, and 29-32) are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected Group II there being no allowable generic or linking claim.

**Applicants' Argument**

Applicants have argue the following issue:

1. Group I contains the claims directed to the product and process specially adapted to making said product and Group II relates to the uses of the products of Group I ; therefore, the present restriction requirement is improper.

With respect to applicants' arguments, the examiner has maintained that Group I and Group II lack a special technical feature. In the instant case, the invention of Group I is directed to the quaternary ammonium compounds and the process of making the multiple functional quaternary ammonium compounds by reacting diamine with the dicarboxylic acid, whereas the invention of Group II is directed to the viscosity modifying agent, the ore flotation aid and the surfactant composition containing the quaternary ammonium compounds. Both may have a common core of the quaternary ammonium compounds. However, according to Norton et al (U.S. 3,760,879), the Group II, a formaldehyde-sulfite reacted polyacryamide can be used as the viscosity modifying agent, the ore flotation aid and the surfactant devoid of any presence of the quaternary ammonium compounds. From this, Group I is not the special technical feature required in producing the viscosity modifying agent, the ore flotation aid and the surfactant composition.

There is no single general inventive concept and no unity of invention for the method or the process as defined in 37 CFR 1.475.

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The requirement is still deemed proper and is therefore made FINAL.

***Claim Objections***

Claim 1 is objected to because of the following informalities:

In claim 1, the structural formulas (I), (II) or (III) are described; however, there is no comma between the structural formulas (I), (II), and (III).

Therefore, an appropriate correction is required.

**Claim Rejections - 35 USC § 112**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-2 (their depending claims ) and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claim 1 , the symbol “ n” is used in the description of formula I, II or III.

However, there is no specific range for the “ n” values in the claimed formulas.

Therefore, an appropriate correction is required.

In claim 2, the phrases “ C12-C18 alkyl groups containing an ester linkage ” and “ C12-C18 alkyl groups containing an amide linking group ” are recited. This is vague and indefinite because the term “ containing” is an open language without a limit in the claim; the expression do not exclude the presence of other ingredients than the one or ones recited. Exparte Muench , 79 USPQ 92 (PTO BD. APP. 1948) and Swain V. Crittendon , 332 F 2d 820 , 141 USPQ 811 (C.C.P.A 1964). Therefore, an appropriate correction is required.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: one of the steps is involved in heating both dialkylalkanol amine and a dicarboxylic acid at a specific temperature; another step is related to how the reaction mixture is quaternized with what types of reagent and under what reaction conditions (i.e. reaction temperature) can be employed for the process. This is because such reaction conditions and a choice of reagents will be critical to determine the outcome of the desired product.

In claims 1, 7, and 25, the term "general" is recited. The expression is vague and indefinite because the specification does not elaborate how general the formula can be for the process. Therefore, an appropriate correction is required.

Claims 8–11 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: one of the steps is involved in ethoxylating a fatty amine at a specific temperature range; another step is related to how the reaction mixture is quaternized with what type of reagent and under what reaction conditions (i.e. reaction temperature) can be employed for the process. This is because such reaction conditions and a choice of reagents will be critical to determine the outcome of the desired product.

In claim 10, the phrase "a long chain alkylhalide reagent" is recited. This is vague and indefinite because the specification does not elaborate how long the carbon chain for the alkyl halide reagent can be used in the process. Therefore, an appropriate correction is required.

Claims 12–14 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: the step is involved in reacting a diamine with a dicarboxylic acid at a specific temperature range. This is because the

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selection of specific workable temperature range will be critical to determine the formation of the desired product.

In claims 15, 19, and 21, the phrases " C12-C18 alkyl groups containing an ester or amide function " is recited. This is vague and indefinite because the term "containing" is an open language without a limit in the claim; the expression do not exclude the presence of other ingredients than the one or ones recited. Exparte Muench , 79 USPQ 92 (PTO BD. APP. 1948) and Swain V. Crittendon , 332 F 2d 820 , 141 USPQ 811 (C.C.P.A 1964). Therefore, an appropriate correction is required.

Claims 25-27 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: one of the steps is involved in reacting a polyaminoalkyl compound with alkyl or alkenyl aldehyde or alcohol compounds under specific reaction conditions ,such as specific temperature range, specific reducing agent; another step is related to how the reaction mixture is methylated and quaternized with what type of reagent and under what reaction conditions (i.e. reaction temperature) can be employed for the process. This is because such reaction conditions and a choice of methylating and quaternizing reagents will be critical to determine the outcome of the desired product.



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In claims 1, 25, and 28, the phrase "said alkyl or alkenyl groups optionally contain at least one ester linkage, at least one amide linkage" is recited. This is vague and indefinite because the term "contain" is an open language without a limit in the claim; the expression does not exclude the presence of other ingredients than the one or ones recited. Exparte Muench, 79 USPQ 92 (PTO BD. APP. 1948) and Swain V. Crittendon, 332 F.2d 820, 141 USPQ 811 (C.C.P.A. 1964). Therefore, an appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Bunton et al (J. Org. Chem., vol. 86, no. 16, 1971 p. 2346-2350).

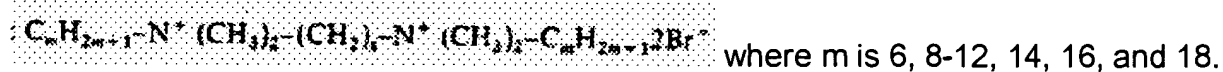
Bunton et al discloses dicationic detergents:

$RN^+Me_2(CH_2)_nN^+Me_2R \cdot 2Br^-$  (where R = cetyl and n = 4 and 6) (see p. 2346, abstract section). This is identical with the claims.

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2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Th. Dam et al ( Physicochem. Eng. Aspects 118, 1996, p.41-49).

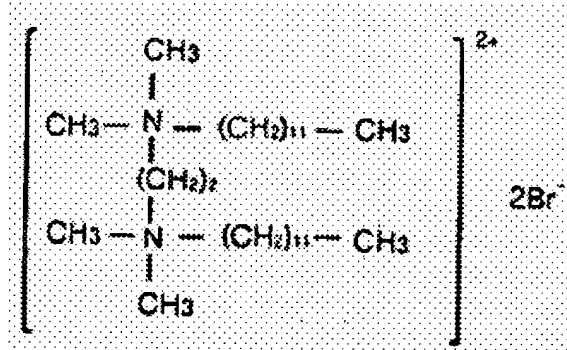
Th. Dam et al discloses Gemini surfactants:



(see p. 42 ,table 1). This is identical with the claims.

3. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Kunio Esumi et al ( Physicochem. Eng. Aspects 118, 1996, p.161-166).

Kunio Esumi et al discloses 1,2-bis(dodecyldimethyl-ammonio)ethane dibromide:



(see p. 162 ,fig. 1). This is identical with the claims.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Zhao et al ( J. Phys. Chem. B. vol. 102, no. 39 (1998), p. 7613-7618).

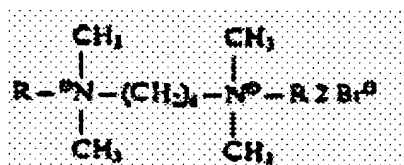
Zhao et al discloses dimeric cationic surfactants (alkanedily-alpha,omega-bis(alkyldimethylammonium) salt having the following structure (see abstract page) :

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$C_mH_{2m+1}(CH_2)_2N^+(CH_3)_2(C_2H_5)_2N^+(CH_3)_2C_mH_{2m+1} \cdot 2Br^-$ , where m-s-m is selected from the following values (12-2-12, 14-2-14, 16-2-16, 16-4-16, and 16-6-16). This is identical with the claims.

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Devinsky et al (Tenside Detergents 22 (1985), p. 10-15).

Devinsky et al discloses N, N'-bis(alkyldimethyl)-1,6-hexanediammonium dibromides below:



R is equal to octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentadecyl, and hexadecyl (see page 11, table 2). This is identical with the claims.

6. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Zana et al (Langmuir 1991, 7, p. 1072-1075).

Zana et al discloses (alkanedily-alpha,omega-bis(alkyldimethylammonium bromide surfactants having the following structure :



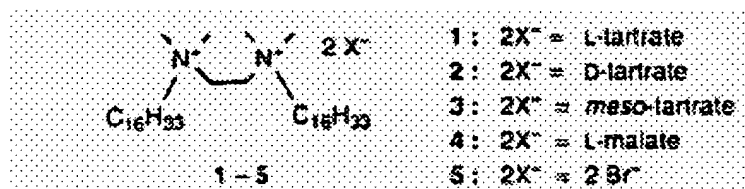
(see page 1075, table III).

This is identical with the claims.

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7. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Oda et al ( Angew. Chem. Int. Ed. 1998, 37, no. 19 p. 2689-2691).

Oda et al discloses gemini surfactants :



(see page 2689, top right col. ).

This is identical with the claims.

8. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Morey et al ( Microporous material 6 (1996) 99-104).

A gemini surfactant (Bromide salt of [C<sub>18</sub>H<sub>37</sub>(CH<sub>3</sub>)<sub>2</sub>N-C<sub>12</sub>H<sub>24</sub>-N(CH<sub>3</sub>)<sub>2</sub>C<sub>18</sub>H<sub>37</sub>]<sup>2+</sup>) has been synthesized by reacting α,ω-dibromodecane with N,N,N-octodecanedimethylamine

(see page 100 , left col. a middle

paragraph) .

This is identical with the claims.

9. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Rogen et al ( J. of Surfactants and Detergents, vol. 1 ,no. 4 (10 1998)).

Rogen et al discloses gemini surfactants, such as

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and  $C_{12}H_{25}N^+(CH_3)_2(CH_2)_mN^+ \cdot (CH_3)_2C_{12}H_{25}2Br^- \quad (16)$  (see page 547, right col. , third paragraph) .

This is identical with the claims.

10. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Vk aswal et al ( Physical review a. 57(1): 776-783, 10, 1998).

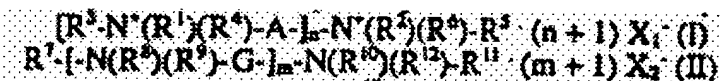
Vk aswal et al discloses the dimeric surfactants:



where 16-m-16 is for different length of hydrocarbon spacers m=3-6, 8, 10, and 12 (see abstract page ). This is identical with the claims.

11. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Japan Patent No. (JP 09256273-A) ( 3/25/96).

Japan Patent No. discloses the following cationic surfactants (see abstract page ):



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$R^1, R^2 = 10-28$  C satd. hydrophobic hydrocarbon;  
 $R^3, R^4 = 1-6$  C alkyl or hydroxylalkyl;  
 $A = 2-12$  C alkylene or hydroxyalkylene;  
 $n = \text{more than } 2$ ;  
 $X_1 = \text{halogen}$ ;  
 $R^5 = 10-28$  C satd. hydrophobic hydrocarbon;

$R^6, R^{12} = 1-6$  C alkyl or hydroxylalkyl;  
 $G = 2-10$  C alkylene;  
 $m = 0$  or more than 1;  
 $X_2 = \text{halogen}$ ;

This is identical with the claims.

12. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Zana et al ( Langmuir, 13 (21):5552-5557, 1997 October 15) .

Zana et al discloses the dimeric surfactants ,such as (alkanedily-alpha,omega-bis(alkyldimethylammonium bromide having 12-s-12 and 12-s/2 (s/2 =carbon number of the variable alkyl chain varying from 1 to 10) (see abstract page ). This is identical with the claims.

13. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Chorro et al ( Journal of colloid & Intereface Science , 199(2): 169-176, 3, 1998).

Chorro et al discloses alkanedily-alpha,omega-bis(alkyldimethylammonium bromide with spacer groups  $C_2H_4$ ,  $C_4H_8$ ,  $C_6H_{12}$ , and  $C_{10}H_{20}$ . (see abstract page ). This is identical with the claims.

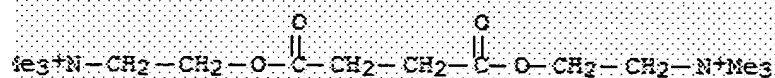
14. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Dreja et al ( Lanmuir, 14(4):800-807, 2, 1998 ).

Dreja et al discloses alkanedily-alpha,omega-bis(alkyldimethylammonium bromide type (m-s-m) with m being 12 and s being 2, 4, 6, 8, 10, and 12 (see abstract page ). This is identical with the claims.

15. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Kharkevich et al ( Farmakologiya I Toksikologiya (Moscow) (1989), 52 (2), 34-7 ).

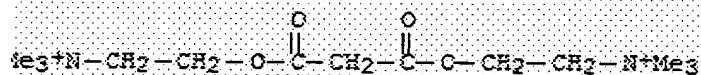
Kharkevich et al discloses various quaternary ammonium compounds (see abstract page ).

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● 2 I<sup>-</sup>

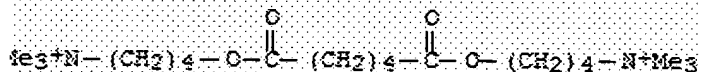
[ 1807-06-3 CAPLUS

[ Ethanaminium, 2,2'-[(1,3-dioxo-1,3-propanediyl)bis(oxy)]bis[N,N,N-trimethyl-, diiodide (9CI) (CA INDEX NAME)

● 2 I<sup>-</sup>

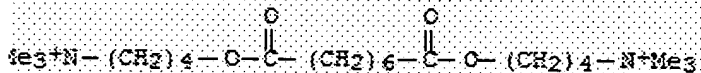
[ 71677-28-6 CAPLUS

[ 1-Butanaminium, 4,4'-[(1,6-dioxo-1,6-hexanediyl)bis(oxy)]bis[N,N,N-trimethyl-, diiodide (9CI) (CA INDEX NAME)

● 2 I<sup>-</sup>

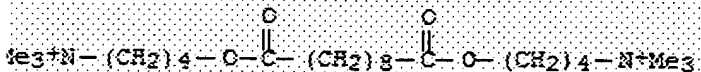
[ 71677-29-7 CAPLUS

[ 1-Butanaminium, 4,4'-[(1,8-dioxo-1,8-octanediyl)bis(oxy)]bis[N,N,N-trimethyl-, diiodide (9CI) (CA INDEX NAME)

● 2 I<sup>-</sup>

[ 71677-30-0 CAPLUS

[ 1-Butanaminium, 4,4'-[(1,10-dioxo-1,10-decanediyl)bis(oxy)]bis[N,N,N-trimethyl-, diiodide (9CI) (CA INDEX NAME)

● 2 I<sup>-</sup>

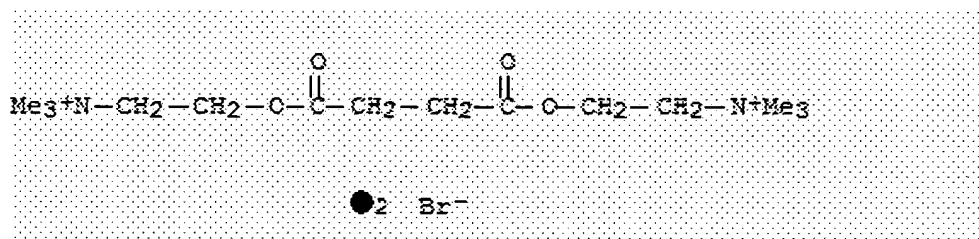


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This is identical with the claims.

16. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Wunderlich ( DD 11654 ,1956 ).

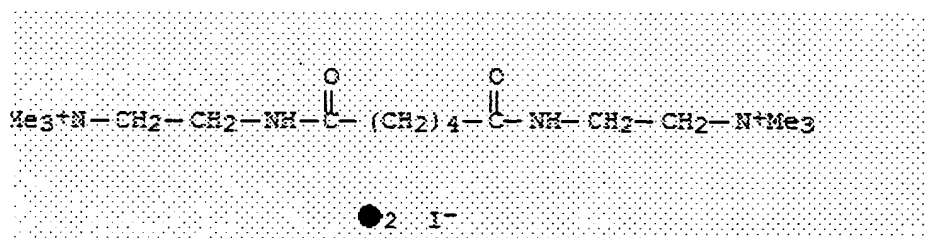
Wunderlich discloses the following quaternary salt(see abstract page ):



This is identical with the claims.

17. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Eisenberg et al ( J. of the American Chem. Soc., 1953, 75, p. 2914-2917).

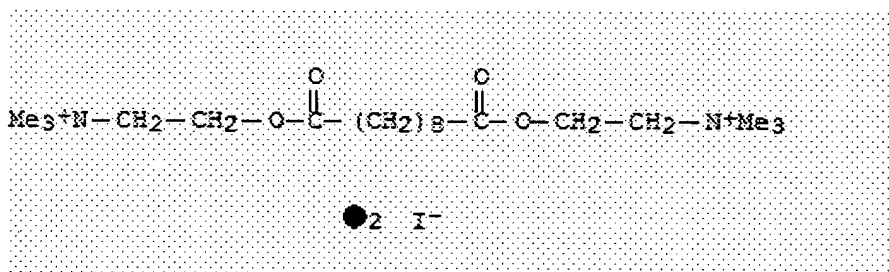
Eisenberg et al discloses the following quaternary salt(see abstract page ):



This is identical with the claims.

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18. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Ginzel et al ( Archives Internationals de Pharmacodynamie et de therapie, 1951, 87, 79-98). Ginzel et al discloses the following quaternary salt(see abstract page ):

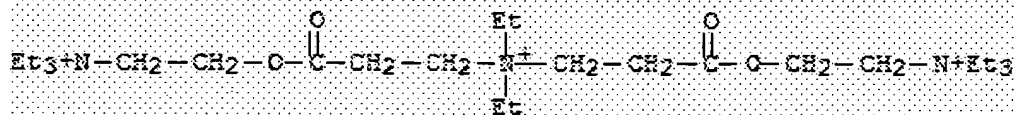


This is identical with the claims.

19. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Carey Macleod et al ( J. of Pharmacy and Pharmacology , 1961, 13 , p. 103 t-106 t).

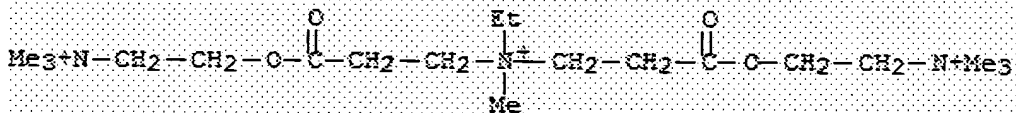
Carey Macleod et al discloses the following quaternary salts (see abstract page ):

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● 3 I<sup>-</sup>

N 17089-57-5 CAPLUS

N 1-Propanaminium, N-ethyl-N-methyl-3-oxo-N-[3-oxo-3-{2-(trimethylammonio)ethoxy}propyl]-3-{2-(trimethylammonio)ethoxy}-, triiodide (9CI) (CA INDEX NAME)

● 3 I<sup>-</sup>

This is identical with the claims.

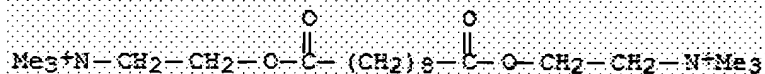
20. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated clearly by Beznosko et al ( Farmakologiya I Toksikologiya (Moscow) (1980), 43 (1), 44-48, abstract pages 2 ).

Beznosko et al discloses various quaternary ammonium compounds (see abstract page ).

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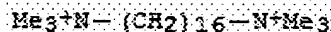
EN 7095-43-4 CAPLUS

EN Ethanaminium, 2,2'-[(1,10-dioxo-1,10-decanediyl)bis(oxy)]bis[N,N,N-trimethyl- (9CI) (CA INDEX NAME)]



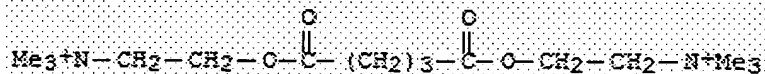
EN 16414-68-9 CAPLUS

EN 1,16-Hexadecanediaminium, N,N,N,N',N',N'-hexamethyl- (9CI) (CA INDEX NAME)



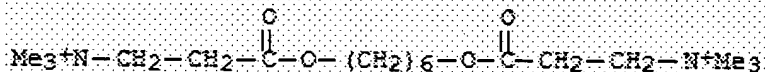
EN 54941-17-2 CAPLUS

EN Ethanaminium, 2,2'-[(1,5-dioxo-1,5-pentanediy)bis(oxy)]bis[N,N,N-trimethyl- (9CI) (CA INDEX NAME)]



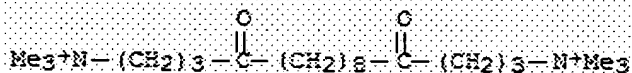
EN 73414-13-8 CAPLUS

EN 1-Propanaminium, 3,3'-[1,6-hexanediy)bis(oxy)]bis[N,N,N-trimethyl-3-oxo- (9CI) (CA INDEX NAME)]



EN 73461-12-8 CAPLUS

EN 1,16-Hexadecanediaminium, N,N,N,N',N',N'-hexamethyl-4,13-dioxo- (9CI) (CA INDEX NAME)



This is identical with the claims.

***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

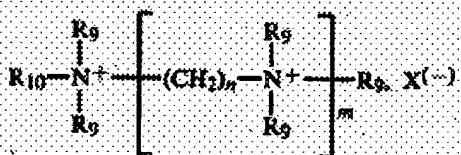
The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudkin et al (US 4,179,382).

Art Unit: 1625

Rudkin et al discloses suitable water-soluble cationic surfactants which include the substituted polyamine salt of general formula below (see col. 4 , lines 38-58):



wherein  $\text{R}_{10}$  is an alkyl or alkenyl groups having from about 16 to 24, preferably from 16 to 20, especially from 16 to 18 carbon atoms, the groups  $\text{R}_9$  which may be the same or different, each represent hydrogen, a  $(\text{C}_2\text{H}_4\text{O})_p\text{H}$ , or a  $(\text{C}_3\text{H}_6\text{O})_q\text{H}$ , or a  $\text{C}_{1-3}$  alkyl groups where  $p$  and  $q$  may each be 0 or a number such that  $(p+q)$  does not exceed 25,  $n$  is an integer from 2 to 6, preferably 3,  $m$  is from about 1 to 9, preferably from 1 to 4, most preferably 1 to 2, and  $\text{X}^{(-)}$  represents one or more anions having total charge balancing that of the nitrogen atoms.

However, the instant invention differs from the prior art in that the claimed compounds are not exemplified.

Even so, the generic formula of the prior art does offer guidance that it may include the claimed compounds by reviewing their substituents  $\text{R}_9$  and  $\text{R}_{10}$ , where  $\text{R}_{10}$  is an alkyl group or alkenyl group having 16-20, whereas  $\text{R}_9$  is a  $\text{C}_{1-3}$  alkyl group. Furthermore, the prior art does disclose the following compound (see col. 5 ,lines 4-5):



Therefore, if the skilled artisan had desired to make suitable water-soluble cationic surfactants containing  $\text{R}_9$  of a  $\text{C}_{1-3}$  alkyl group instead of hydrogen as an alternative

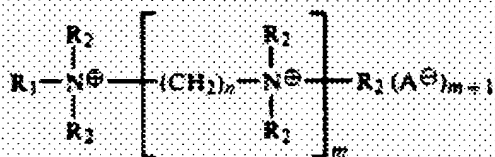
to  $\text{Tallowyl}-\text{N}^+\text{H}_2-(\text{CH}_2)_3-\text{N}^+\text{H}_3, 2(\text{OCOCH}_3)^-$ , it would have been obvious to the

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skilled artisan in the art to be motivated to modify the prior art compound to the claimed compound. This is because the skilled artisan in the art would expect such a modification to be successful and feasible as guidance(see col. 4 , lines 38-58) shown in the prior art.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wells (US RE 34,062) in view of Zhao et al ( J. Phys. Chem. B. vol. 102, no. 39 (1998), p. 7613-7618).

Wells discloses suitable water-soluble cationic surfactants which include the substituted polyamine salt of general formula below (see col. 3 , lines 20-34):



wherein

$R_1 = C_{10}-C_{24}$ , preferably  $C_{16}-C_{18}$  alkyl or alkenyl group

$R_2 = H$  or  $(C_2H_4O)_pH$  or  $(C_3H_6O)_qH$  or  $C_1-C_3$  alkyl in which

$p$  and  $q$  are 0 or a number such that  $p + q$  is at most 25,

$n =$  a whole number from 2-6, preferably 3,

$m =$  a whole number from 1-9, preferably 1-4,

$A^- =$  an anion, preferably a halide or acetate.

However, the instant invention differs from the prior art in that the claimed compounds are not exemplified.

Zhao et al discloses dimeric cationic surfactants (alkanedily-alpha,omega-bis(alkyldimethylammonium) salt having the following structure(see abstract page) :

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$C_mH_{2m+1}(CH_2)_2N^+(CH_2)_2N^+(CH_3)_2C_mH_{2m+1} \cdot 2Br^-$ , where m-s-m is selected from the following values (12-2-12, 14-2-14, 16-2-16, 16-4-16, and 16-6-16).

The generic formula of the Wells prior art does offer guidance that it may include the claimed compounds by reviewing their substituents  $R_1$  and  $R_2$ , where  $R_1$  is an alkyl group or alkenyl group having 16-18, whereas  $R_2$  is a  $C_{1-3}$  alkyl group. Furthermore, the Zhao et al prior art does exemplify the various carbon chain of (alkanedilyl- $\alpha,\omega$ -bis(alkyldimethylammonium) salt, which can be used as surfactants. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the teachings of Zhao's et al specific compounds into the Wells prior art in order to show that the claimed compounds can be known in the art. This is because the skilled artisan in the art would expect such a combination to be successful and feasible as guidance(see col. 3, lines 20-34) shown in the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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*Myh ✓ Oh*  
*6/27/55*